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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/507,465	02/22/2000	Rodney C. Langley	M4065.0018/P018-A	2423

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EXAMINER

ANDERSON, MATTHEW A

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 08/05/2003

27

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/507,465

Applicant(s)

LANGLEY ET AL.

Examiner

Matthew A. Anderson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10,13-16 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10,13-16 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10, 16, 26 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Helms et al. (US 4,869,801).

An embodiment represented in Fig. 4 of Helms and described in detail in col. 4 lines 13+ anticipates the present invention. Disclosed is a RIE (i.e. a plasma) etching apparatus and method. The wafer is placed on a chuck plate which is coupled to a pedestal with a central hollow shaft. The chuck and pedestal combine to define cooling passages (73, 74, 75 in Fig. 4) connected in fluid communication with the hollow shaft. The pedestal is rotated by the motor (84). The apparatus is described as used in a RIE

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chamber with cooling and rotation. In Figs. 4 is depicted a method of removing the wafer by push rod (51) coupled to a lift actuator (40) and spider (46 with pins 47, 47'). The actuated push rods push up and the lift pins (47) lift the wafer from the chuck. The hollow cooled shaft of the pedestal (Fig. 4, 45) moves in response to actuation of the wafer lift mechanism.

It is unclear if the cooling medium is limited to only a liquid which must be stationary during the process.

However, it would have been obvious to one of ordinary skill in the art at the time of the present invention to use a gas coolant since Helms et al. suggests as much in col. 3 line 1.

In respect to claims, 10, 26, one of ordinary skill in the art would have found it obvious that the coolant chamber of Helms would have received and maintained coolant gas because coolant gas was described as blown into the closed space (57) during processing (col. 4 lines 35+).

Claim Rejections - 35 USC § 103

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Helms et al. as applied to the above claims.

Helms is described above.

Although Helms does not specifically name the positions of the vertically movable shaft but one of ordinary skill would logically conclude that clamping and wafer

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unloading would be included in the step positions (col. 4 lines 30-45) because wafer clamping and lifting operations are specified (col. 4 lines 30-45).

4. Claim 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helms et al. as applied to the above claims, and further in view of Saeki et al. (US 5460684) and Nozawa et al. (US 5290,381).

Helms is described above.

Helms does not explicitly disclose an electrostatic chuck.

Saeki et al. discloses in the abstract an electrostatic chuck in a plasma apparatus used in a plasma etching process.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to combine the Helms et al. and the Saeki et al. references because then the placement of the wafer would be even more accurate than as required by Helms et al. since the electrostatic chuck would preclude movement during processing.

The combination does not disclose the optimization of process parameters.

Nozawa et al. discloses a plasma etching apparatus and discloses using certain set process parameters in col. 7. The parameters specified include gas flow and wafer temperature.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to combine Nozawa et al. with the above combination because then

more control over the etching profile produced (see Figs. 5-7 of Nozawa et al.) would be expected.

Response to Arguments

5. Applicant's arguments filed 11/15/2002 have been fully considered but they are not persuasive.

The argument that the amended claims are allowable because of the "maintaining" language is not convincing. The Helms reference indicates He gas is blown into the space closed during the processing to increase thermal conductivity (i.e. cooling) of the wafer by the support plate. The examiner further argues that "maintaining" could also mean a flow of gas as long as some coolant gas was maintained in the coolant chamber.

The argument that the 102/103 rejection is not proper is unconvincing. The 102/103 rejection was made noting the description in col. 4 beginning on line 35 which suggests using He gas from the hollow shaft. This is also suggested in Fig. 2 in another embodiment.

The argument that there is no motivation in Helms to modify the reference teachings is not convincing since Helms itself suggests the He coolant gas as the gas flows during processing.

The argument that the suggestion in col. 3 to use He coolant is irrelevant to the next embodiment is not convincing since He gas is suggested in reference to Fig. 4 also (col. 4 line 35).

The examiner notes that although the applicant argues that the reliance on Helms is "suspect" because of alleged inconsistencies in depictions, the examiner notes Helms is a valid US Patent. Also, the examiner notes that the applicant is referring to Figures 2 and 3 which are different embodiments than that depicted in Fig. 4.

The argument against the combination of references used to reject claims 14, 15 is not convincing. A motivation for combination was presented by the examiner previously.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Anderson whose telephone number is (703) 308-0086. The examiner can normally be reached on M-Th, 6:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

MAA
August 4, 2003

Matthew Anderson
A.U. 1765